What is claimed is:

1. An adaptive antenna, comprising:

a plurality of antenna elements for forming a plurality of beams that cover a predetermined service area;

detecting means for detecting ~~the~~ a communication amount of data transmitted or received with each of the beams; and

controlling means for controlling a ~~pattern~~ direction and width of each of the beams corresponding to the detected communication amount.

2. The adaptive antenna as set forth in claim 1,

wherein said controlling means has beam pattern controlling means for controlling ~~a pattern~~ the direction and width of each of the beams corresponding to the detected communication amount so as to cause the communication amounts of the beams to be nearly matched.

3. The adaptive antenna as set forth in claim 1,

wherein said plurality of antenna elements has a plurality of first antenna elements and a plurality of second antenna elements, the first antenna elements composing a transmitting antenna portion, the second antenna elements comprising a receiving antenna portion and being analogous to the transmitting antenna portion, the ratio of the size of the transmitting antenna portion to the size of the receiving antenna portion being equal to the reciprocal of the ratio of a transmission frequency to a reception frequency.

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~~4~~ 3. The adaptive antenna as set forth in claim 1, wherein said controlling means has means for controlling ~~a~~ the ~~pattern~~ direction and width of each of the beams when ~~the~~ a maximum communication amount of each of the beams exceeds a predetermined value.

~~5~~ 4. The adaptive antenna as set forth in claim 2, wherein said beam pattern controlling means controls ~~the~~ an exciting weight of each of the antenna elements so as to control ~~a pattern~~ the direction and width of each of the beam.

~~6~~ 5. The adaptive antenna as set forth in claim 2, wherein said beam pattern controlling means controls the ~~beam widths~~ width of at least a first beam and a second beam, the first beam having ~~the~~ a maximum communication amount, the second beam having ~~the~~ a minimum communication amount.

~~7~~ 6. The adaptive antenna as set forth in claim 2, wherein said beam pattern controlling means controls the ~~beam widths~~ width of at least a first beam and a second beam, the first beam having ~~the~~ a maximum communication amount, the second beam having ~~the~~ a minimum communication amount while keeping ~~the~~ a sum of ~~the beam width of each beam~~ widths nearly constant.

~~8~~ 7. The adaptive antenna as set forth in claim ~~5~~ 4, wherein said beam pattern controlling means has:

a weight information storing unit for storing exciting weight information of each of the antenna elements so as to accomplish ~~the optimum pattern~~ optimum control of each of the beams

corresponding to the communication amount of each of the beams; and

means for selecting relevant exciting weight information in said weight information storing unit.

9. The adaptive antenna as set forth in claim 5, wherein said beam pattern controlling means has:

a pattern information storing unit for storing the optimum pattern information of each of the beams corresponding to the communication amount of each of the beams; and

means for calculating an exciting weight of which the difference between a pattern of each of the beams and a pattern of each of the beams stored in said pattern information storing unit becomes minimum.

10. The adaptive antenna as set forth in claim 5, wherein said beam pattern controlling means switches an exciting weight of each of said antenna elements in steps so as to control the ~~pattern~~ direction and width of each of the beams.

11. An adaptive antenna, comprising:

a plurality of antenna elements for forming a plurality of beams that cover a predetermined service area;

detecting means for detecting for each of the beams ~~the~~ a communication amount of data transmitted or received with each of the beams; and

controlling means for controlling a ~~pattern~~ direction and width of each of the beams corresponding to the detected communication amount for

each of the beams.

12. The adaptive antenna as set forth in claim 11, wherein said controlling means has beam pattern controlling means for controlling ~~a pattern~~ the direction of each of the beams corresponding to the detected communication amount so as to cause the communication amounts of the beams to be nearly matched.

13. The adaptive antenna as set forth in claim 11, wherein said plurality of antenna elements has a plurality of first antenna elements and a plurality of second antenna elements, the first antenna elements composing a transmitting antenna portion, the second antenna elements comprising a receiving antenna portion and being analogous to the transmitting antenna portion, the ratio of the size of the transmitting antenna portion to the size of the receiving antenna portion being equal to the reciprocal of the ratio of a transmission frequency to a reception frequency.

14. The adaptive antenna as set forth in claim 11, wherein said controlling means has means for controlling ~~a pattern~~ direction and width of each of the beams when ~~the~~ a maximum communication amount of each of the beams exceeds a predetermined value.

15. The adaptive antenna as set forth in claim 12, wherein said beam pattern controlling means controls ~~the~~ an exciting weight of each of the antenna elements so as to

control ~~a pattern~~ the direction and width of each of the beam.

~~16~~ 14. The adaptive antenna as set forth in claim ~~12~~ 11, wherein said beam pattern controlling means controls the ~~beam widths~~ width of at least a first beam and a second beam, the first beam having ~~the~~ a maximum communication amount, the second beam having ~~the~~ a minimum communication amount.

~~17~~ 15. The adaptive antenna as set forth in claim ~~12~~ 11, wherein said beam pattern controlling means controls the ~~beam widths~~ width of at least a first beam and a second beam, the first beam having ~~the~~ a maximum communication amount, the second beam having ~~the~~ a minimum communication amount while keeping ~~the~~ a sum of ~~the beam width of each beam~~ width nearly constant.

~~18~~ 16. The adaptive antenna as set forth in claim ~~15~~ 13, wherein said beam pattern controlling means has:

a weight information storing unit for storing exciting weight information of each of the antenna elements so as to accomplish ~~the optimum pattern~~ optimum control of each of the beams corresponding to the communication amount of each of the beams; and

means for selecting relevant exciting weight information in said weight information storing unit.

~~19~~ 17. The adaptive antenna as set forth in claim 15, wherein said beam pattern controlling means has:

a pattern information storing unit for storing the optimum

pattern information of each of the beams corresponding to the communication amount of each of the beams; and

means for calculating an exciting weight of which the difference between a pattern of each of the beams and a pattern of each of the beams stored in said pattern information storing unit becomes minimum.

~~18~~ 13. ~~20.~~ The adaptive antenna as set forth in claim ~~15~~, wherein said beam pattern controlling means switches an exciting weight of each of said antenna elements in steps so as to control the ~~pattern~~ direction and width of each of the beams.